

CLAIMS

What is claimed is:

1. A crankcase ventilation system for a vehicle which routes vented crankcase gases to an intake manifold for combustion, said vehicle including an air cleaner, a first compressor located downstream from said air cleaner and having an inlet to receive air from said air cleaner, an aftercooler located downstream from said first compressor, and an engine located downstream from said aftercooler, said engine having an intake manifold, a crankshaft, a crankcase and a crankcase breather port through which blow-by gases exit said crankcase, said crankcase ventilation system comprising:
 - 10 a second air compressor having an inlet and an outlet capable of delivering pressurized air to said intake manifold; and a breather line having an inlet to receive crankcase blow-by gases exiting said breather port and having an outlet that delivers said blow-by gases to said inlet of said second air compressor.
- 15 2. The crankcase ventilation system of claim 1 further comprising an oil separator located along said breather line prior to said second air compressor inlet.
3. The crankcase ventilation system of claim 1 wherein said second air compressor is a positive-displacement type compressor.
- 20 4. The crankcase ventilation system of claim 3 wherein said second air compressor is powered by said crankshaft.

5. The crankcase ventilation system of claim 3 wherein said second air compressor is a screw-type air compressor.

5 6. The crankcase ventilation system of claim 3 wherein said second air compressor is a piston-type air compressor.

7. The crankcase ventilation system of claim 1 further comprising a relief valve located along said breather line prior to said second air compressor inlet wherein
10 said relief valve is configured to open when the air pressure in said breather line exceeds a predetermined value.

8. The crankcase ventilation system of claim 7 wherein said relief valve further includes a sensor to detect when said relief valve is open.

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9. A crankcase ventilation system for a vehicle which routes vented crankcase gases to an intake manifold for combustion, said vehicle including an air cleaner, a turbocharger compressor located downstream from said air cleaner and having an inlet to receive air from said air cleaner, an aftercooler located downstream from said 20 turbocharger compressor and having an inlet to receive air from said turbocharger compressor, an engine located downstream from said aftercooler, said engine having an intake manifold, a crankshaft, a crankcase and a crankcase breather port through which

blow-by gases exit said crankcase, and an aftercooler outlet conduit connecting said aftercooler to said intake manifold, said crankcase ventilation system comprising:

an air compressor having an inlet and an outlet capable of delivering pressurized air to said aftercooler outlet conduit at a point between said aftercooler and said intake
5 manifold;

a breather line having an inlet to receive crankcase blow-by gases exiting said breather port and having an outlet that delivers said blow-by gases to said inlet of said air compressor; and

10 a bleed air line having an inlet to receive air from said air cleaner, an outlet to deliver air to said inlet of said air compressor, and a one-way flow valve located between said bleed air inlet and said bleed air outlet, wherein said flow valve prevents airflow from said bleed air outlet to said bleed air inlet.

10. The crankcase ventilation system of claim 9 further comprising an oil separator located along said breather line between said breather port and said air compressor inlet.

11. The crankcase ventilation system of claim 9 wherein said air compressor is a positive-displacement type air compressor.

20 12. The crankcase ventilation system of claim 11 wherein said air compressor is powered by said crankshaft.

13. The crankcase ventilation system of claim 11 wherein said air compressor is a screw-type air compressor.

14. The crankcase ventilation system of claim 11 wherein said air compressor
5 is a piston-type air compressor.

15. The crankcase ventilation system of claim 9 further comprising a relief valve located along said breather line prior to said air compressor inlet wherein said relief valve is configured to open when the air pressure in said breather line exceeds a
10 predetermined value.

16. The crankcase ventilation system of claim 15 wherein said relief valve further includes a sensor to detect when said relief valve is open.

15 17. The crankcase ventilation system of claim 9 further comprising a shut off valve located along said aftercooler outlet conduit between said air compressor outlet and said intake manifold.

18. A crankcase ventilation system for a vehicle which routes vented
20 crankcase gases to an intake manifold for combustion, said vehicle including an air cleaner, a first compressor located downstream from said air cleaner and having an inlet to receive air from said air cleaner, an aftercooler located downstream from said first compressor, and an engine located downstream from said aftercooler, said engine having

an intake manifold, a crankshaft, a crankcase and a crankcase breather port through which blow-by gases exit said crankcase, said crankcase ventilation system comprising:

a second air compressor having an inlet and an outlet capable of delivering pressurized air to said intake manifold;

5 a breather line having an inlet to receive crankcase blow-by gases exiting said breather port and having an outlet that delivers said blow-by gases to said inlet of said second air compressor; and

a bleed air line having an inlet to receive air from said aircleaner, an outlet that delivers said air to said inlet of said second air compressor, and a one-way flow valve located between said bleed air inlet and said bleed air outlet, wherein said valve prevents airflow from said bleed air outlet to said bleed air inlet.

10 19. The crankcase ventilation system of claim 18 further comprising an oil separator located along said breather line prior to said second air compressor inlet.

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20 20. The crankcase ventilation system of claim 18 wherein said second air compressor is a positive-displacement type compressor.

21 21. The crankcase ventilation system of claim 20 wherein said second air 20 compressor is powered by said crankshaft.

22 22. The crankcase ventilation system of claim 20 wherein said second air compressor is a screw-type air compressor.

23. The crankcase ventilation system of claim 20 wherein said second air compressor is a piston-type air compressor.

5 24. The crankcase ventilation system of claim 18 further comprising a relief valve located along said breather line prior to said second air compressor inlet wherein said relief valve is configured to open when the air pressure in said breather line exceeds a predetermined value.

10 25. The crankcase ventilation system of claim 24 wherein said relief valve further includes a sensor to detect when said relief valve is open.